0055863 H1393

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR TNUHANFORD B01-059 H1393

LVL LOT # :0106L113 DATE RECEIVED: 06/20/01

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|----------------------|---------|-----|----------|------------|-----------|----------|
| | | | | | <u> </u> | |
| B126D6 | | | | | | • |
| CHLORIDE BY IC | 001 | W | 01LICB41 | 06/18/01 | 06/22/01 | 06/22/01 |
| CHLORIDE BY IC | 001 REP | W | 01LICB41 | 06/18/01 | 06/22/01 | 06/22/01 |
| CHLORIDE BY IC | 001 MS | W | 01LICB41 | 06/18/01 | 06/22/01 | 06/22/01 |
| FLUORIDE BY IC | 001 | W | 01LICB41 | 06/18/01 | 06/22/01 | 06/22/01 |
| FLUORIDE BY IC | 001 REP | W | 01LICB41 | 06/18/01 | 06/22/01 | 06/22/01 |
| FLUORIDE BY IC | 001 MS | W | 01LICB41 | 06/18/01 | 06/22/01 | 06/22/01 |
| NITRITE BY IC | 001 | W | 01LICB41 | 06/18/01 | 06/22/01 | 06/22/01 |
| NITRITE BY IC | 001 REP | W | 01LICB41 | 06/18/01 | 06/22/01 | 06/22/01 |
| NITRITE BY IC | 001 MS | W | 01LICB41 | 06/18/01 | 06/22/01 | 06/22/01 |
| NITRATE BY IC | 001 | W | 01LICB41 | 06/18/01 | 06/22/01 | 06/22/01 |
| NITRATE BY IC | 001 REP | W | 01LICB41 | 06/18/01 | 06/22/01 | 06/22/01 |
| NITRATE BY IC | 001 MS | W | 01LICB41 | 06/18/01 | 06/22/01 | 06/22/01 |
| PHOSPHATE BY IC | 001 | W | 01LICB41 | 06/18/01 | 06/22/01 | 06/22/01 |
| PHOSPHATE BY IC | 001 REP | W | 01LICB41 | 06/18/01 | 06/22/01 | 06/22/01 |
| PHOSPHATE BY IC | 001 MS | W | 01LICB41 | 06/18/01 | 06/22/01 | 06/22/01 |
| SULFATE BY IC | 001 | W | 01LICB41 | 06/18/01 | 06/22/01 | 06/22/01 |
| SULFATE BY IC | 001 REP | W | 01LICB41 | 06/18/01 | 06/22/01 | 06/22/01 |
| SULFATE BY IC | 001 MS | W | 01LICB41 | 06/18/01 | 06/22/01 | 06/22/01 |
| NITRATE NITRITE | 001 | W | 01LN3C36 | 06/18/01 | 07/02/01 | 07/02/01 |
| NITRATE NITRITE | 001 REP | W | 01LN3C36 | 06/18/01 | 07/02/01 | 07/02/01 |
| NITRATE NITRITE | 001 MS | W | 01LN3C36 | 06/18/01 | 07/02/01 | 07/02/01 |
| AMMONIA | 001 | W | 01LAMA32 | 06/18/01 | 06/27/01 | 06/28/01 |
| AMMONIA | 001 REP | W | 01LAMA32 | 06/18/01 | 06/27/01 | 06/28/01 |
| AMMONIA | 001 MS | W | 01LAMA32 | 06/18/01 | 06/27/01 | 06/28/01 |
| TOTAL ORGANIC CARBON | 001 | W | 01LTC037 | 06/18/01 | 07/13/01 | 07/13/01 |
| TOTAL ORGANIC CARBON | 001 REP | W | 01LTC037 | 06/18/01 | 07/13/01 | 07/13/01 |
| TOTAL ORGANIC CARBON | 001 MS | W | 01LTC037 | 06/18/01 | 07/13/01 | 07/13/01 |
| AB QC: | | | | | | |
| | | | | | | |
| | | | | | | |
| CHLORIDE BY IC | MB1 | W | 01LICB41 | N/A | 06/22/01 | 06/22/01 |
| CHLORIDE BY IC | MB1 BS | W | 01LICB41 | | 06/22/01 | 06/22/01 |
| FLUORIDE BY IC | MB1 | W | 01LICB41 | | 06/22/01 | 06/22/01 |
| FLUORIDE BY IC | MB1 BS | W | 01LICB41 | | 06/22/01 | 06/22/01 |
| NITRITE BY IC | MB1 | W | 01LICB41 | | 06/22/01 | 06/22/01 |



Lionville Laboratory, Inc. INORGANIC ANALYTICAL DATA PACKAGE FOR TNUHANFORD B01-059 H1393

DATE RECEIVED: 06/20/01 LVL LOT # :0106L113

| CLIENT ID /ANALYSIS | LVL | # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|----------------------|-----|-----|-----|----------|------------|-----------|----------|
| NITRITE BY IC | MB1 | BS | W | 01LICB41 | N/A | 06/22/01 | 06/22/01 |
| NITRATE BY IC | MB1 | | W | 01LICB41 | n/A | 06/22/01 | 06/22/01 |
| NITRATE BY IC | MB1 | BS | W | 01LICB41 | N/A | 06/22/01 | 06/22/01 |
| PHOSPHATE BY IC | MB1 | | W | 01LICB41 | N/A | 06/22/01 | 06/22/01 |
| PHOSPHATE BY IC | MBl | BS | W | 01LICB41 | N/A | 06/22/01 | 06/22/01 |
| SULFATE BY IC | MB1 | | W | 01LICB41 | N/A | 06/22/01 | 06/22/01 |
| SULFATE BY IC | MB1 | BS | W | 01LICB41 | N/A | 06/22/01 | 06/22/01 |
| NITRATE NITRITE | MB1 | | W | 01LN3C36 | N/A | 07/02/01 | 07/02/01 |
| NITRATE NITRITE | MB1 | BS | W | 01LN3C36 | N/A | 07/02/01 | 07/02/01 |
| AMMONIA | MB1 | | W | 01LAMA32 | N/A | 06/27/01 | 06/28/01 |
| AMMONIA | MB1 | BS | W | 01LAMA32 | N/A | 06/27/01 | 06/28/01 |
| AMMONIA | MB1 | BSD | W | 01LAMA32 | N/A | 06/27/01 | 06/28/01 |
| TOTAL ORGANIC CARBON | MB1 | | W | 01LTC037 | N/A | 07/13/01 | 07/13/01 |
| TOTAL ORGANIC CARBON | MB1 | BS | W | 01LTC037 | N/A | 07/13/01 | 07/13/01 |



Analytical Report

Client: TNU-HANFORD B01-059 H1393

W.O.#: 11343-606-001-9999-00

LVL#: 0106L113

Date Received: 06-20-01

INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 water sample.

- 2. The sample was prepared and analyzed in accordance with the methods checked on the attached glossary.
- 3. Sample holding times as required by the method and/or contract were met with the exception of Nitrate, Nitrite and Phosphate that were analyzed past hold.
- 4. The cooler temperature was recorded on the chain of custody.
- 5. The method blanks were within the method criteria.
- 6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Ammonia was within the 20% Relative Percent Difference (RPD) control limit.
- 7. The matrix spike recoveries were within the 75-125% control limits.
- 8. The replicate analyses were within the 20% RPD control limit.
- 9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Deputy Laboratory Manager

Lionville Laboratory Incorporated

07-26-01

Date

njp\i06-113

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 13 pages.

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

| | EPA /600 | SW846 | OTHER |
|---|-------------|-----------------|--|
| Acidity | 305.1 | | |
| AlkalinityBicarbonateCarbonate | 310.1 | | |
| BOD | 405.1 | | 5210B (b) |
| lon Chromatography: | | | |
| Bromide Chloride Fluoride | 300.0 | 9056 | |
| NitrateNitritePhosphate | 300.0 | 9056 | |
| ✓ SulfateFormateAcetateOxalate | 300.0 | 9056 | |
| Chloride | 325.2 | 9251 | |
| Chorine, Residual | 330.5 (mod) | | |
| Cyanide, Amenable to Chlorination | 335.2 | 9010B | |
| Cyanide, Total | 335.2 | 9010B 9014 | ILMO4.0 (e) |
| Cyanide, Weak Acid Dissociable | | | 412 (a) 4500CN-I (b) |
| COD | 410.4(mod) | | 5220C (b) |
| Color | 110.2 | | |
| Corrosivity by Coupon | | 1110(mod) | |
| Chromium VI | | 7196A | 3500Cr-D (b) |
| Fluoride | 340.2 | | 4500-FC |
| Hardness, Calcium | 215.2 | | |
| Hardness, Total | 130.2 | | |
| lodide | | | ASTM D19P202 (1) |
| Surfactant | 425.1 | | |
| ✓ Nitrate-NitriteNitrateNitrite | 353.2 | | |
| Ammonia | 350.3 | | |
| TotalKjeldahlOrganic Nitrogen | 351.3 | 1 | |
| Total Organic Inorganic Carbon | 415.1 | <u> </u> | |
| Oil & Grease | 413.1 | 9070 | |
| pH pH; paper | 150.1 | 9040B 9041A | |
| Petroleum Hydrocarbons, Total Recoverable | 418.1 | | |
| Phenol | | 120.2 9065 906 | |
| OrthoTotal Phosphate | 365.2 | | 4500-P B C |
| Salinity | 1.00.5 | | 210A (a) 2520 (b) |
| Settleable Solids | 160.5 | 00000 4000 | 4 / 11 1 1 1 1 1 1 1 1 |
| Sulfide | 376.1 | | 4 (acid soluble) |
| ReactiveCyanideSulfide | 220.1 | Section 7.3 (90 | 0149030B) |
| Silica | 370.1 | | |
| Sulfite | 377.1 | 0029 | |
| Sulfate | 375.4 | 9038 | |
| Specific Conductance | 120.1 | 9050A | D5057.00 212E (a) |
| Specific Gravity | | 1212 | - D5057-90 $-$ 213E (a) |
| Synthetic Precipitation Leach | | 1312 | |
| TotalDissolvedSuspendedSolids | | 23 | |
| Total Organic Halides | 450.1 | 9020B | |
| Turbidity Veletile Soliday | 180.1 | | |
| Volatile Solids: | 160 4 | | |
| TotalDissolvedSuspended | 160.4 | Mathadi | |
| Other: | | Method: | |

Lionville Laboratory Incorporated

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- * = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LC = Laboratory Control Sample.

NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

- 1. ASTM Standard Methods.
- USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).
- 3. Test Methods for Evaluating Solid Waste (USEPA SW-846).
- a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).
- b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).
- c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).
- d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).
- e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.
- f. Code of Federal Regulations.

INORGANICS DATA SUMMARY REPORT 07/17/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

| | | | | | REPORTING | DILUTION |
|--------|---------|----------------------|---------|-------|-----------|----------|
| SAMPLE | SITE ID | analyte | RESULT | Units | LIMIT | FACTOR |
| | | ************ | ******* | ***** | | |
| -001 | B126D6 | Chloride by IC | 0.88 | MG/L | 0.25 | 1.0 |
| | | Fluoride by IC | 0.25 u | MG/L | 0.25 | 1.0 |
| | | Nitrite by IC | 0.25 u | MG/L | 0.25 | 1.0 |
| | | Nitrate by IC | 0.52 | MG/L | 0.25 | 1.0 |
| | | Phosphate by IC | 0.25 u | MG/L | 0.25 | 1.0 |
| | | Sulfate by IC | 0.28 | MG/L | 0.25 | 1.0 |
| | | Nitrate Nitrite | 0.035 | MG/L | 0.020 | 1.0 |
| | | Ammonia, as N | 0.12 | MG/L | 0.10 | 1.0 |
| | | Total Organic Carbon | 1.1 | MG/L | 0.50 | 1.0 |

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/17/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

| MORE ORDI | IR: 11343-000-001-9999 | | | | REPORTING | DILUTION |
|-----------|------------------------|----------------------|--------|-------|-----------|----------|
| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | LIMIT | PACTOR |
| | | ******* | | **** | | |
| BLANK10 | 01LICB41-MB1 | Chloride by IC | 0.25 u | MG/L | 0.25 | 1.0 |
| | | Fluoride by IC | 0.25 u | MG/L | 0.25 | 1.0 |
| | | Nitrite by IC | 0.25 u | MG/L | 0.25 | 1.0 |
| | | Nitrate by IC | 0.25 u | MG/L | 0.25 | 1.0 |
| | | Phosphate by IC | 0.25 u | MG/L | 0.25 | 1.0 |
| | | Sulfate by IC | 0.25 u | MG/L | 0.25 | 1.0 |
| BLANK10 | 01LN3C36-MB1 | Nitrate Nitrite | 0.020u | MG/L | 0.020 | 1.0 |
| BLANK10 | 01LAMA32-MB1 | Ammonia, as N | 0.10 u | MG/L | 0.10 | 1.0 |
| BLANK10 | 01LTC037-MB1 | Total Organic Carbon | 0.50 u | MG/L | 0.50 | 1.0 |

INORGANICS ACCURACY REPORT 07/17/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

| | | | SPIKED | INITIAL | SPIKED | | DILUTION |
|---------|--------------|----------------------|--------|---------|--------|--------|--------------|
| SAMPLE | SITE ID | ANALYTE | SAMPLE | RESULT | AMOUNT | *RECOV | FACTOR (SPK) |
| | ************ | **************** | ====== | | | | ******** |
| -001 | B126D6 | Chloride by IC | 6.5 | 0.88 | 5.0 | 111.7 | 1.0 |
| | | Fluoride by IC | 10.8 | 0.00 | 10.0 | 108.0 | 1.0 |
| | | Nitrite by IC | 5.12 | 0.25u | 5.00 | 102.4 | 1.0 |
| | | Nitrate by IC | 5.31 | 0.52 | 5.00 | 95.9 | 1.0 |
| | | Phosphate by IC | 4.9 | 0.25u | 5.0 | 97.2 | 1.0 |
| | | Sulfate by IC | 5.2 | 0.28 | 5.0 | 98.6 | 1.0 |
| | | Nitrate Nitrite | 0.50 | 0.035 | . 0.50 | 93.6 | 1.0 |
| | | Ammonia, as N | 2.1 | 0.12 | 2.0 | 99.8 | 1.0 |
| | | Total Organic Carbon | 6.4 | 1.1 | 5.0 | 107.1 | 1.0 |
| BLANK10 | 01LICB41-MB1 | Chloride by IC | 4.6 | 0.25u | 5.0 | 91.3 | 1.0 |
| | | Fluoride by IC | 10.7 | 0.25u | 10.0 | 106.8 | 1.0 |
| | | Nitrite by IC | 4.77 | 0.25u | 5.00 | 95.3 | 1.0 |
| | | Nitrate by IC | 4.98 | 0.25u | 5.00 | 99.7 | 1.0 |
| | | Phosphate by IC | 4.9 | 0.25u | 5.0 | 99.0 | 1.0 |
| | | Sulfate by IC | 4.8 | 0.25u | 5.0 | 95.7 | 1.0 |
| BLANK10 | 01LN3C36-MB1 | Nitrate Nitrite | 0.51 | 0.02u | 0.50 | 102.8 | 1.0 |
| BLANK10 | 01LAMA32-MB1 | Ammonia, as N | 2.0 | 0.10u | 2.0 | 99.0 | 1.0 |
| | | Ammonia, as N MSD | 2.0 | 0.10u | 2.0 | 102.0 | 1.0 |
| BLANK10 | 01LTC037-MB1 | Total Organic Carbon | 5.2 | 0.50u | 5.0 | 104.3 | 1.0 |

INORGANICS DUPLICATE SPIKE REPORT 07/17/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

WORK ORDER: 11343-606-001-9999-00

SAMPLE

| | | SPIKE#1 | SPIKE#2 | : |
|---------|---------|---------|---------|-------|
| SITE ID | ANALYTE | *RECOV | *RECOV | *DIFF |
| | | ***** | | |

INORGANICS PRECISION REPORT 07/17/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

| | | | INITIAL | | | DILUTION |
|--------|-----------|----------------------|---------|-----------|-------|--------------|
| SAMPLE | S SITE ID | ANALYTE | RESULT | REPLICATE | RPD | factor (REP) |
| | | ************** | ***** | | ***** | |
| -001RE | BP B126D6 | Chloride by IC | 0.88 | 0.77 | 14.2 | 1.0 |
| | | Fluoride by IC | 0.25u | 0.25u | NC | 1.0 |
| | | Nitrite by IC | 0.25u | 0.25u | NC | 1.0 |
| | | Nitrate by IC | 0.52 | 0.54 | 3.0 | 1.0 |
| | | Phosphate by IC | 0.25u | 0.25u | NC | 1.0 |
| | | Sulfate by IC | 0.28 | 0.26 | 5.6 | 1.0 |
| | | Nitrate Nitrite | 0.035 | 0.035 | 0.00 | 1.0 |
| | | Ammonia, as N | 0.12 | 0.12 | 4.9 | 1.0 |
| | | Total Organic Carbon | 1.1 | 1.1 | 1.2 | 1.0 |

Lionville Laboratory Use Only 01066113

Custody Transfer Record/Lab Work Request Page 1 of /

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

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| MATRIX CODES: S - Soll SE - Sediment SO - Solid | Lab ID | Clie | ent ID/Descri | iption | | Cho (+ | С | Matrix | Date Collected | Time Collected | CLOSHH | XSZYO | | | | | | mr t O | | 1435 1435 1436 1436 1436 1436 1436 1436 1436 1436 | 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 | エカガシへ エカシのと | TOCT | | |
| SL - Sludge W - Water | 00 | BIGION | _ | 1 | | | | (D) | (0-18-0) | 1305 | | _/ | | | | | | | | / | | / | | | |
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| DS - Drum Solids | | | | | | | | | | | | | <u> </u> | | | | | | | | | | | | |
| DL - Drum Liquids | | | | | | | | | | | | | | | | - | | | | | | | | | |
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| Special Instruct | Special Instructions: DOY DOI-057 Mc+0 1.Cd.Cr.Cu, Qi, Ag. Ph Samples were: Tamper Resistant Seal was: 1) Shipped or 1) Present on Outer Package or Alshill # | | | | | | | | | | | | | | | | | | | | | | | | |
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| Relinquished | T | Received | Date | Time | Reli | inquis | shed | | 6 Received by | 0 | ate | Tin | ne | Sam | pies La | es Betv | d _ | 5) (| Property Preserved COC Record Present Or N Upon Sample Rec't 5) Received Within or N | | | | | | |
| Fix Ex | 4 | V-Kenn | 6/00/01 | 0935 | | | OSIT | | | PRIGI | | - | | NOT | : Recor ES: 235 | d? Y (| × (N) 54. | ны 525 | lding Ti | mes Y o | N | | oler mp | 60 | - ° C |
| | | 0 | | | | WAS | STE | _L_ | R | EWRI | TTE | N | | <u>''</u> | | , , | - / (| - <u></u> -/ | <u> </u> | | | | | | |

| | Hanford Inc. | | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST B01-059-1 Page 1 of 1 | | | | | | | | | | | | | | |
|--|--|---------------------------------|------------|--|------------------------|---|--|--------|--|---------------------|-------------|--|--|--------|---------------|-----------------|-----------|---|
| Collector Thomas, G/Watson | , D. | | : | Compa Todo | ny Contact | Telepho | ne No. 372-963 | | | | Proj | ject Coordin | | Pri | ice Code | 7N | | maround |
| Project Designation 200-TW-1 & 2 - Qe | C Sampling | | | | ng Location 5/200 W | | | • | | | SAF | | | | Air Quality 🔲 | | 45 | Days |
| | 2096 | 0651 | Jof ≥ | | ogbook No. 1518 | | COA B20TW1A44C Method of Shipment Fed Ex | | | | | | - | | | - 41 | | |
| Shipped To TMA/RECRA | | | 1 | Offsite | Property No. | 210434 Bill of | | | | | of Lading/A | ₹\$P | N9-C | 756 | 260 | Place | | |
| POSSIBLE SAMPI | LE HAZARDS/RE Samples did not radiological cont total activity ass | originate in rolled area. No | | | Preservation | HNO3 to pH | Cool | ı4C | H2SO4 to pH | HC1 or H to pH < | | Cool 4C | HNO3 to | pH | | | | 10/1-40 |
| Special Handling | sample/samples. and/or Storage | . 6· | 10.01 | | Type of Container | P | P | • | P | ∍Gs | • | aG | •G | | | | - | |
| | | | | | No. of Container(s) | 1 | 1 | | 1 | 3 | | 2 | 2 | \neg | | | | |
| | | | | | Volume | 500mL | 500 | mL | 500mL | . 40m | T. | 1000mL | 1000n | 7 | | | | |
| SAMPLE ANALYSIS | | | | | | See item (1) in Special Instructions. | See item Spec Instruc | cisl | Aramonia - 350.3; NO2/NO3 - 353.1; TOC - 9060 | VOA - 8: | L) L | Semi-VOA 8270A (Add- On) (Tributyl phosphate) | Gross Al- Gross F | 18. a | | | | |
| Sample No | | Matrix * | Samp | le Date | Sample Time | | | | | | | | 7 | | | | | |
| B126D6 | v | VATER | 06-18- | 0) | 1305 | Х | × | | X | × | 7 | Ϋ́ | | | | | | |
| | | | | | | | - | | | | | | _ | | | | | |
| | | | 1 | | | | ┼─ | | | | \dashv | | +- | | | <u> </u> | | <u> </u> |
| | | | | | | | - | | | | \dashv | | / | | | | | <u> </u> |
| CHAIN OF PO | | · | | gn/Print | | | | SPEC | IAL INSTR | UCTIO | NS | | | | <u> </u> | 1 | L | Matrix * |
| Relinquished By/Remove Relinquished By/Remove COD 2 | 2 470 sd From 3778 1 | 677 i | 30 Receive | dBy/Ston | oche | 16/Time 101 15 16/Time 04 | 100 | (Add-c | m) {Lead} | | | dmium, Chrom uoride, Nitrate, | | | | }; ICP Metals - | 6010A | 9=Soil 85=Sediment 80=Solid 81=Studge W = Water |
| Relinquished By/Remove | thed By/Removed From Date/Time Date/Time Date/Time Date/Time Samples stored in Ref.# Lat the 3728 Shipping Facility on 1/18/101. Collector not available to relinquish samples | | | | | | | | O-Oil A-Air DS-Drum Solidy DL-Drum Liquide Tu-Tienne Wi-Wipe L-Liquid V-Vagazation | | | | | | | | | |
| Relinquished By/Remove | | ate/Time | | d By/Store | | nte/Time | | | on <u>(<i>O</i></u> | <u> </u> | יטנ | for shipmo | ent | 4 | AT Office | 51 | | X=Other |
| LABORATORY SECTION | Received By | | | | | Ti | tle | | - | | | | | | | D | ate/Time | |
| FINAL SAMPLE DISPOSITION | Disposal Method | | | | | | | | Dispos | sed By | | | | | | Г | Pate/Time | <u> </u> |

Figure 1. Sample Check-in List

| Date/Time Received: 6/40/01 0835 | |
|--|--|
| SDG#: 01066113 | • |
| Work Order Number: | SAF# B01-059 |
| Shipping Container ID: | Chain of Custody # |
| 1. Custody Seals on shipping container intact? | Yes [4] No [] |
| 2. Custody Seals dated and signed? | Yes [] No [] |
| 3. Chain-of-Custody record present? | Yes [] No [] |
| 4. Cooler temperature 6° | · |
| 5. Vermiculite/packing materials is | Wet [] Dry [] |
| 6. Number of samples in shipping container: | |
| 7. Sample holding times exceeded? | Yes [] No [] |
| | hazard labels appropriate sample labels |
| 9. Samples are:in good conditionbroken | leaking have air bubbles |
| 10. Were any anomalies identified in sample rec11. Description of anomalies (include sample m | ombers): |
| Sample Custodian/Laboratory: Laboratory: L | Date: 6/2401 |



Lionville Laboratory, Inc. TNUHANFORD B01-059 H1393

DATE RECEIVED: 06/20/01 LOL LOT # :0106L113

CLIENT ID /ANALYSIS LVL # MTX PREP # COLLECTION EXTR/PREP ANALYSIS

10/91/40 10/11/40 T0/8T/90 TIPOTIO М 001 KED LEAD, TOTAL TO/9T/LO TO/TT/40 TO/8T/90 LEAD, TOTAL OTPOTT М TOO T0/9T/L0 10/11/40 T0/8T/90 TTFOTTO SW TOO **TATOT** NICKEL' 10/91/40 10/11/40 T0/8T/90 CIPOTIO М OOI KED **TATOT NICKEL** T0/9T/L0 TO/TT/LO T0/8T/90 OIFOGII М T00 **TATOT** NICKEL 10/91/40 10/11/40 T0/8T/90 OIFOGII М SW TOO JATOT COPPER, TO/9T/LO 10/11/40 T0/8T/90 OIPOWII OOJ KED TATOT М COPPER, TO/9T/40 T0/TT/L0 TO/8T/90 TTFOTTO М TOO COPPER, TOTAL 10/91/40 T0/TT/L0 10/81/90 TTFOTTO М SW TOO CHROMIUM, TOTAL T0/9T/L0 10/11/40 T0/8T/90 OTFO#II 001 KEB CHROMIUM, TOTAL М TO/9T/LO TO/TT/LO TO/8T/90 CIPOTIO М T00 CHROMIUM, TOTAL TO/9T/LO 10/11/40 TO/8T/90 TIPOTIO М SW TOO CADMIUM, TOTAL, TO/9T/LO TO/TT/LO T0/8T/90 CIPOTIO M 001 KEP TATOT CADMIUM, T0/9T/L0 TO/TT/LO TO/8T/90 OTPOGII М TOO TATOT CADMIUM, 10/91/40 TO/TT/LO TTFOTTO 10/81/90 М SW TOO JATOT SILVER, T0/9T/L0 το/ττ/Δο T0/8T/90 TIFOTIO 001 KED М **LATOT SIPAEK** T0/9T/L0 TO/TT/LO T0/8T/90 OTFOGIT M TOO **TATOT** SILVER,

TTFOTTO

М

SW TOO

LAB QC:

reyD,

BISED6

TATOT

| 10/91/40 | 10/11/40 | $A \setminus U$ | 0110411 | М | BI | PEAD, TOTAL N |
|----------|----------|-----------------|----------|---|-------|-----------------------|
| TO/9T/LO | TO/TT/LO | Α\Ν | OIPO#II | M | CT BS | LEAD LABORATORY I |
| TO/9T/LO | 10/11/40 | A\N | OTPO¶TI | М | IBI | NICKEL, TOTAL N |
| TO/9T/LO | TO/TT/LO | A\N | OIPO#II | М | CI BS | NICKEL LABORATORY I |
| TO/9T/LO | TO/TT/LO | Α\N | 0100411 | M | IBI | COPPER, TOTAL N |
| TO/9T/LO | TO/TT/LO | A\U | OIPO∉II | М | CI BS | COPPER LABORATORY I |
| TO/9T/LO | TO/TT/LO | Α\N | OTPOGTT | M | IBT | CHROMIUM, TOTAL N |
| TO/9T/LO | 10/11/60 | Α\И | OIFOGII | М | CJ BZ | CHROMIUM LABORATORY I |
| TO/9T/LO | TO/TT/LO | A\N | OIPO#II | M | IBJ | CADMIUM, TOTAL N |
| TO/9T/LO | 10/11/40 | А\И | 07170477 | М | CI BS | CADMIUM LABORATORY I |
| TO/9T/LO | 10/11/20 | A\N | OTPOGTT | M | IBI | SILVER, TOTAL N |
| 10/91/10 | το/ττ/Δο | A\N | 0110411 | М | CI BS | SILVER LABORATORY I |

TO/9T/LO

TO/TT/LO

TO/8T/90



Analytical Report

Client: TNU-HANFORD B01-059

LVL#: 0106L113

SDG/SAF#: H1393/B01-059

W.O.#: 1343-606-001-9999-00

Date Received: 06-20-01

METALS CASE NARRATIVE

1. This narrative covers the analyses of 1 water sample.

- 2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
- 3. All analyses were performed within the required holding times.
- 4. The cooler temperature has been recorded on the Chain of Custody.
- 5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.
- 6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
- 7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
- 8. All ICP Interference Check Standards were within control limits.
- 9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.
- 10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.
- 11. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
- 12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of pages.

13. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Deputy Laboratory Manager Lionville Laboratory Incorporated

iiw/m06-113

27-90-01



METALS METHOD GLOSSARY

| The following methods are used as reference | for the | digestion | and | analysis | of | samples | contained | within | this |
|---|---------|-----------|-----|----------|----|---------|-----------|--------|------|
| Recra Lot#: 0106Li13 | | | | | | | | | |

 Leaching Procedure: __1310 __1311 __1312 __Other: _____

 CLP Metals __Digestion and __Analysis Methods: __ILM03.0 __ILM04.0

 Metals Digestion Methods: __3005A __3010A __3015 __3020A __3050B __3051 __200.7 __SS17 __Other: ______

Metals Analysis Methods

| | IVI | etais Alialysis Me | เมงนร | | |
|-------------|---------------------------------------|---------------------------------------|-------------|--------------|--------------|
| | | | | EPA | |
| | SW846 | EPA | STD MTD | OSWR | USATHAMA |
| Aluminum | 6010B | 200.7 | | | 99 |
| Antimony | 6010B7041 ⁵ | 200.7204.2 | | | _99 |
| Arsenic | 6010B7060A ⁵ | 200.7206.2 | 3113B | | 99 |
| Barium | 6010B | 200.7 | | | 99 |
| Beryllium | 6010 B | 200.7 | | | 99 |
| Bismuth | 6010B ¹ | 200.7 1 | | 1620 | 99 |
| Boron | 6010 B | 200.7 | | | 99 |
| Cadmium | ≽_6010B 7131A ⁵ | 200.7213.2 | | | 99 |
| Calcium | 6010B | 200.7 | | | 99 |
| Chromium | ≥ 6010B7191 ⁵ | 200.7218.2 | | | SS17 |
| Cobalt | 6010B | 200.7 | | | 99 |
| Copper | 7 6010B7211 ⁵ | 200.7220.2 | | | 99 |
| lron | 6010 B | 200.7 | | | 99 |
| Lead | <u>∞</u> 6010B7421 ⁵ | 200.7239.2 | 3113B | | 99 |
| Lithium | 6010B7430 ⁴ | 200.7 | | 1620 | 99 |
| Magnesium | 6010B | 200.7 | | | 99 |
| Manganese | 6010 B | 200.7 | | | 99 |
| Mercury | 7470A ³ 7471A ³ | 245.1 ² 245.5 ² | | | 99 |
| Molybdenum | 6010 B | 200.7 | | | 99 |
| Nickel | 1 6010 B | 200.7 | | | 99 |
| Potassium | 6010B7610 ⁴ | 200.7258.1 4 | | | 99 |
| Rare Earths | 6010B ¹ | 200.7 1 | | 1620 | 99 |
| Selenium | 6010B7740 ^s | 200.7270.2 | 3113B | | 99 |
| Silicon | 6010B ¹ | 200.7 | | 1620 | 99 |
| Silica | 6010 B | 200.7 | | <u></u> 1620 | 99 |
| Silver | № 6010B 7761 ⁵ | 200.7 272.2 | | | 99 |
| Sodium | 6010B 7770 ⁴ | 200.7 273.1 4 | | | 99 |
| Strontium | | 200.7 | | | 99 |
| Thallium | 6010B 7841 ⁵ | 200.7279.2: | 200.9 | | |
| Tin | 6010B | | | | 99 |
| Titanium | 6010 B | 200.7 | | | |
| Uranium | 6010B ¹ | 200.7 1 | | 1620 | 99 |
| Vanadium | 6010B | 200.7 | | · | 99 |
| Zinc | 6010B | 200.7 | | | 99 |
| Zirconium | 6010B 1 | 200.7 1 | | 1620 | 99 |
| | | | | | _ |

Other:______ Method:

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- * = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LCS = Laboratory Control Sample.

NC = Not calculated.

ANALYTICAL METAL METHODS

- 1. Not included in the method element list.
- 2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).
- 3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).
- 4. Flame AA.
- 5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

INORGANICS DATA SUMMARY REPORT 07/16/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

| wordt Ord | 11145-000-001-3339 | | | | REPORTING | DILUTION |
|-----------|--------------------|-----------------|--------|-------|-----------|----------|
| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | LIMIT | PACTOR |
| | | ******** | | | ****** | ****** |
| -001 | B126D6 | Silver, Total | 2.8 U | UG/L | 2.8 | 1.0 |
| | | Cadmium, Total | 4.3 u | UG/L | 4.3 | 1.0 |
| | | Chromium, Total | 3.9 | UG/L | 3.9 | 1.0 |
| | | Copper, Total | 4.7 | UG/L | 2.4 | 1.0 |
| | | Nickel, Total | 11.4 U | UG/L | 11.4 | 1.0 |
| | | Lead, Total | 31.2 U | UG/L | 31.2 | 1.0 |

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/16/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | RBPORTING LIMIT | DILUTION FACTOR |
|--------|---------------|--|--------|---|-------|--------------------|--------------------|
| | ************* | ###################################### | | | **** | ******* | |
| BLANK1 | 01L0411-MB1 | Silver, Total | 2.8 | u | UG/L | 2.8 | 1.0 |
| | | Cadmium, Total | 4.3 | u | UG/L | 4.3 | 1.0 |
| | | Chromium, Total | 3.9 | u | UG/L | 3.9 | 1.0 |
| | | Copper, Total | 2.4 | u | UG/L | 2.4 | 1.0 |
| | | Nickel, Total | 11.4 | u | UG/L | 11.4 | 1.0 |
| | | Lead, Total | 31.2 | u | UG/L | 31.2 | 1.0 |

INORGANICS ACCURACY REPORT 07/16/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

| | | | SLIVED | THILLIAM | SAIVED | | DIFOLION |
|---------|------------|-----------------|--------|----------|--------|--------|--------------|
| SAMP | LE SITE ID | ANALYTE | SAMPLE | RESULT | AMOUNT | *RECOV | Pactor (SPK) |
| E = 4 = | | | | ***** | **=== | | |
| -001 | B126D6 | Silver, Total | 45.3 | 2.8 u | 50.0 | 90.6 | 1.0 |
| | | Cadmium, Total | 42.6 | 4.3 u | 50.0 | 85.2 | 1.0 |
| | | Chromium, Total | 186 | 3.9 | 200 | 91.0 | 1.0 |
| | | Copper, Total | 229 | 4.7 | 250 | 89.7 | 1.0 |
| | | Nickel, Total | 471 | 11.4 u | 500 | 94.2 | 1.0 |
| | | Lead, Total | 463 | 31.2 u | 500 | 92.5 | 1.0 |

INORGANICS PRECISION REPORT 07/16/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

| | | | INITIAL | | | DILUTION |
|---------|---------|-----------------|---------|-----------|------|--------------|
| SAMPLE | SITE ID | ANALYTE | RESULT | REPLICATE | RPD | Factor (REP) |
| | | ************** | ***** | ****** | | |
| -001REP | B126D6 | Silver, Total | 2.8 u | 2.8 u | NC | 1.0 |
| | | Cadmium, Total | 4.3 u | 4.3 u | NC | 1.0 |
| | | Chromium, Total | 3.9 | 4.5 | 14.3 | 1.0 |
| | | Copper, Total | 4.7 | 4.9 | 4.2 | 1.0 |
| | | Nickel, Total | 11.4 u | 11.4 u | NC | 1.0 |
| | | Lead, Total | 31.2 u | 31.2 u | NC | 1.0 |

INORGANICS LABORATORY CONTROL STANDARDS REPORT 07/16/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

| | | | SATKED | SLIKED | | |
|--------|-------------|---------------|--------|--------|-------|--------|
| SAMPLE | SITE ID | ANALYTE | SAMPLE | AMOUNT | Units | *RECOV |
| | ********* | ******** | ***** | | | |
| LCS1 | 01L0411-LC1 | Silver, LCS | 493 | 500 | UG/L | 98.6 |
| | | Cadmium, LCS | 244 | 250 | ng/r | 97.4 |
| | | Chromium, LCS | 506 | 500 | UG/L | 101.2 |
| | | Copper, LCS | 1260 | 1250 | UG/L | 100.6 |
| | | Nickel, LCS | 2040 | 2000 | UG/L | 102.2 |
| | | Lead, LCS | 2550 | 2500 | UG/L | 102.2 |

| Lionville Laboratory | Use | Only |
|--------------------------------------|-----|------|
| $\Omega \times \Omega \times \Omega$ | ス | |

Custody Transfer Record/Lab Work Request Page 1 of 1

| | | | | | | | | | | | ABC | DE | | | | _ | | F | | G- | 4 | H - | OSVIII EL | ARORATO | RY INC |
|---------------------------|----------|--|--|----------------|------------------|------------------------------|------------------|-----------|-----------------|-------------------|-------------|---------------------|-------------|----------|----------|--------------------|---------|---------|-------------------|----------|-------------|----------|----------------------------|----------------|-----------|
| Client | TŌ | 1-Hans | ord (| BX01 F0 | P30 | | | Refrige | rator# | 3 | 1 | 4 | | | | | | 4 | | 4- | 1 | N - | H | | |
| Est. Final Pro | | | | | | | | #/Tune | Container | Liquid | 3v | 294 | } | | | | | 1A | | VB6 | 4 | 1196 | A | · | |
| Project # | こと | 3-6000-C | P:10C | 999 | <u> 0 c</u> | <u> </u> | | ,,,, | | Solid | | | , the | | , | | | | | | | | | day ou | |
| Project Conta | ct/Pho | one # | | | | : 125 | | Volume | | Liquid | 40 | 11. | | | | | | 500 | | 500 | -1 | 500 | Н | | |
| Lionville Lab | orator | y Project Manage | <u>~ 0)</u> | | | ادراند. بدیدند | ` | | | Solid | 1 | | | | | | | | | | | | | | |
| oc Sprc | | Del Sta | TAT_ | 30 | 400 | | | Preser | vatives | <u> </u> | ∀ 50 | <u> </u> | | | | | | Hno3 | | | 4 | HSSON | -1 | | |
| • | | | | | • | | | ANALY | | | - | | ANIC > m | <u>a</u> | ł | ł | | | RG | 1 | 1 | | | _ | |
| Date Rec'd | | 5.50-01 | Date Due | | <u> 20.0</u> | 7_ | | REQUE | STED | | Š Š | ₩ ¥ | Pcs Pcs | Herb | | | | Metai | 중 | | | | | | 1 |
| MATRIX | | | | : | | | itrix | | | | | | | ŧ | | Lionv | ille La | borate | ory Us | e Oni | у | 1 | | | |
| CODES: | Lab | Cii | lent ID/Desc | rintion | | | osen OC | Matrix | Date | Time | I | 1 % | | | | ļ | | 0 | | ۱. | OT T | اح | | | |
| S - Soil SE - Sediment | ID | , | | : : | | (| ~) | 1 | Collected | Collected | J. SON H | Xe ² SaX | | 1 | 1 | 1 | | Met | <u> </u> | ع يردا | 887 | 15.5 | 00.7 | | |
| SO - Solid SL - Sludge | <u> </u> | | | | | MS | MSD | | | | 18 | 8 | | | <u> </u> | | | ع | | <u> </u> | SEV | HH | Ĥ | | |
| W - Water O - Oil | ∞ | COS (C | ــــــــــــــــــــــــــــــــــــــ | | ir. | | | w | (0-18-0) | 1305 | 1 | 1 | | | | ļ | | 1 | | 1 | _ | | _ | | <u> </u> |
| A - Ak DS - Drum | | | | | 7 | 3 | | | | i Desert | | | | | | <u> </u> | | | | | | | | | |
| Solids DL - Drum | <u> </u> | | | | į. | #. | | | | | 5. | | | | | | | | | <u> </u> | | | | | <u></u> |
| Liquids L - EP/TCLP | | | | | | | - | | ating secondary | | | | | | | | | | | | | | | | |
| Leachate | | | | | | 1.5 | | | | | | | | | | | | | | | |] | | | Ī |
| Will Wipe X - Other | | | | | | (3 de 1 | 7. 2.4. 7. | | | and the | | | | | | | Ī | | | | · | | | | |
| F Fish | | | | | | See vis | | 111/2 | | 341. FR | | | | | | | | | | | | | | | |
| .* | | | | | . A | 1,000 | | HF 2 | | | | | | | | | | | | | | | | | |
| | | | | 1000 | | | | 7.7 | | | | - | | | | | | | | | | | | | |
| | | | | | | | 1 | 15.7 | | | | | | | | | | | | | | | | | Γ |
| Special Instruct | lione: | Saf Bo | 31-05 | 9 | | <u> </u> | | REVISIO | | L | <u> </u> | | | <u> </u> | | | | | | Lionvi | lle Lab | oratory | Use O | nty | |
| opecial menuc | u01w. | 24, 0 | 51 00 | • | | , | സ്പ | <u>()</u> | 1.CA,C | c'Cn', | Ω i. | عور' | 4D | | | | | | mples | | / | Tar | mper Resi | islant Se | al was: |
| | | • | | 1 | | | | | 2 | | | | | | | | | | Shippe and Del | | _ or | 1) Pa | Present ckage | 000/Ot Y or | iter N |
| | | | | | | | | | 3 | | | | | | | | | | bill #_ | | | 2) | Unbrok | BPSON (| Outer |
| | | | | | | | | | • | | <u>-</u> | | | | | | | | Ambier | | nilled) | | ckage (Present | | |
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| Relinquished | • | Received by. | Date | Time | Re | linqui: by | shed | | Received by | 0 | ate | Tin | 10 | | | es Betv bels ar | | <u></u> | | (b) o | | | on Sam | gje Re | ic't |
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| 1 cm up | -+4 | Jung. | * <i>P*/"</i> | 1-1- | c e | MP | OSIT | | (| PRIG I | NAL | - | \dashv | NOT | | 79 | 54 | 529 | 10 | (Y) 01 | r N | Te | mp | (P | . ℃ |

| | lanford Inc. | CI | HAIN OF CUST | ODY/S | SAMPI | LE ANAL | YSIS | REQUEST | • | B | 01-059-1 | Page 1 | of 1 |
|--|--|------------------|-------------------------|--|------------------|------------------|--------------------|--|---|-------------|--------------|--|---|
| Collector Thomas, G/Watson, D |). | Compa Todo | iny Contact | Telepho | | | | Project Coordin | ator | Price Code | 7N | Data Tur | naround |
| Project Designation 200-TW-1 & 2 - QC S | Sampling | | ing Location 6/200 W | | | | | SAF No. B01-059 | 1 | Air Quality | | 45 J | Days |
| ice Chest No. | 0.96-0651 | | ogbook No. 1518 | | COA B20TW | /1A44C | | Method of Ship Fed Ex | ment | | | - 41 | |
| Shipped To TMACRECRA | , | Offsite | Property No. | 210 | 431 | -{ | | Bill of Lading | A BILLY | 926 | 18 | 201 | PLANIC |
| r | HAZARDS/REMARKS Samples did not originate in radiological controlled area. No total activity associated with | | Preservation | HNO3 to pH | | `\ | HClorHi topH <2 | | HNO3 to pi | | | | 10/1-40 |
| | umpie/samples. | ADI | Type of Container | P | P | P | øGs* | | #G | +- | | | |
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| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | 9/0 | | | | |
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| Relinquished By/Removed | From Date/Time | Received By/Stor | red In D | Date/Time | | VII <u>11</u> | <u>~'</u> | <u>-D</u> [100 3111911 | | 69. | 01 | | A-Ossar |
| LABORATORY ROSECTION | Received By | | | 7 | Title | | | ··· | | | | Date/Time | <u> </u> |
| FINAL SAMPLE DISPOSITION | Disposal Method | | | | | Disp | osed By | | | | <u>,</u> | Date/Time | |

BHI-EE-011 (10/99)

Lionville Laboratory, Inc. BNA ANALYTICAL DATA PACKAGE FOR TNUHANFORD B01-059 H1393

DATE RECEIVED: 06/20/01 LVL LOT # :0106L113

| CLIENT ID | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|------------------|---------------|----------|----------------------|------------|----------------------|----------------------|
| B126D6 | 001 | — — W | 01LE0737 | 06/18/01 | 06/21/01 | 07/05/01 |
| B126D6 | 001 MS | W | 01LE0737 | 06/18/01 | 06/21/01 | 07/05/01 |
| B126D6 | 001 MSD | W | 01LE0737 | 06/18/01 | 06/21/01 | 07/05/01 |
| LAB QC: | | | | | | |
| SBLKAQ SBLKAQ | MB1 MB1 BS | W W | 01LE0737 01LE0737 | N/A N/A | 06/21/01 06/21/01 | 07/05/01 07/05/01 |





Client: TNU-HANFORD B01-059

RFW #: 0106L113

SDG/SAF #: H1393/B01-059

W.O. #: 11343-606-001-9999-00

Date Received: 06-20-2001

SEMIVOLATILE

One (1) water sample was collected on 06-18-2001.

The sample and its associated QC samples were extracted on 06-21-2001 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for client specified Tributylphosphate Semivolatile target compound on 07-05-2001.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
- 2. The sample was extracted and analyzed within required holding times.
- 3. Three (3) of fifteen (15) surrogate recoveries were outside EPA QC limits. However, EPA CLP surrogate recovery criteria were met (i.e., no more than one outlier per fraction {acid and base neutral} and no recoveries less than 10%).
- 4. All matrix spike recoveries were within EPA QC limits.

Three (3) of eleven (11) blank spike recoveries were outside EPA QC limits.

The target compound is not included in the spiking solution. (CLP spike recoveries have been reported on the Form 3.) A copy of the Sample Discrepancy Report (SDR) has been enclosed.

- 5. Internal standard area and retention time criteria were met.
- 6. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

J. Michael Taylo

President

Lionville Laboratory Incorporated

som\gorup\data\bna\tnu-hanford-0106-113.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 1 pages.

02

| Lionville Laboratory Sample Discrepancy Report (SDR) SDR #: <u>O(いらかり</u> |
|---|
| Initiator: July W. Smith Batch: 0106 413 Parameter: 0625 |
| Date: 7/9/01 Samples: 35 Matrix: Water |
| Client: Two Havend BOI -059 Method: SW846 MCAWWICLPI Prep Batch: DILE 0737 |
| H 1393 |
| 1. Reason for SDR |
| a. COC Discrepancy Tech Profile Error Client Request Sampler Error on C-O-C Transcription Error Wrong Test Code Other Other |
| Missing Sample/Extract Container Broken Wrong Sample Pulled Label ID's Illegible |
| Hold Time Exceeded Insufficient Sample Preservation Wrong Received Past Hold |
| Improper Bottle Type Not Amenable to Analysis |
| Note [*] : Verified by [Log-In] or [Prep Group] (circle)signature/date: |
| c. Problem (Include all relevant specific results; attach data if necessary) |
| Three spikesfall low in BS. MS/MSD meet criteria |
| |
| |
| 2. Known or Probable Causes(s) |
| |
| |
| |
| |
| 3. Discussion and Proposed Action Other Description: |
| Re-logEntire BatchFollowing Samples: Re-leach |
| Following Samples: Yeport Vierna |
| · · · · · · · · · · · · · · · · · · · |
| Re-extract Re-digest |
| Revise EDD |
| Change Test Code to |
| Place On/Take Off Hold (circle) |
| 4. Project Manager Instructionssignature/date: |
| ✓ Concur with Proposed Action Disagree with Proposed Action; See Instruction |
| Disagree with Proposed Action, See Instruction Include in Case Narrative |
| Client Contacted: |
| Date/Person |
| Add Cancel I I |
| |
| 5. Final Actionsignature/date: CIT [[G[0] Other Explanation; |
| X Included in Case Narrative |
| Hard Copy COC Revised |
| Electronic COC Revised EDD Corrections Completed |
| - , |
| When Final Action has been recorded, forward original to QA Specialist for distribution and filing. |
| Route Distribution of <u>Completed</u> SDR Route Distribution of <u>Completed</u> SDR |
| X Lab General Manager: M. Taylor Inorganic: Perrone |
| X Project Mgr: Stone/Johnson/Haslett GC/LC: Kiger |
| X_Technical Mgr: Wesson/Daniels MS: Rychlak/Layman X_QA (file): Alberts Log-in: Keppel |
| XQA (file): Alberts Log-in: Keppel Data Management: Feldman Admin: Soos |
| Sample Prep: Beegle/KigerOther: |
| |
| |

GLOSSARY OF BNA DATA

DATA QUALIFIERS

- U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E = .. Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I = Interference.
- NQ = Result qualitatively confirmed but not able to quantify.
- A = Indicates that a TIC is a suspected aldol-condensation product.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y = Additional qualifiers used as required are explained in the case narrative.



GLOSSARY OF BNA DATA

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR * Not Required.

SP, Z = Indicates Spiked Compound.



TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

- MP Missed Peak: manually added peak not found by automatic quantitation program.
- PA Peak Assignment: quantitation report was changed to reflect correct peak assignment.
- RI Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.
- SP Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
- CB Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.
- PI Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.



L-WI-035/a-mi-10/00

Semivolatiles by GC/MS, Special List

Report Date: 07/17/01 16:18

Work Order: 11343606001 Page: la Client: TNUHANFORD B01-059 H1393 RFW Batch Number: 0106L113 B126D6 SBLKAQ SBLKAQ BS B126D6 Cust ID: B126D6 001 MSD 01LE0737-MB1 01LE0737-MB1 001 001 MS RFW#: Sample WATER WATER WATER WATER WATER Information Matrix: 1.00 1.00 1.00 D.F.: 1.00 1.00 UG/L UG/L UG/L UG/L UG/L Units: ¥ 60 ક 52 ક 웋 62 Nitrobenzene-d5 52 왐 72 41 * % 36 * % 40 * % 59 옿 51 ¥ 2-Fluorobiphenyl Surrogate 68 ક 57 % 86 옿 72 Ł Terphenyl-d14 64 ¥ Recovery 10 U 10 U 22 U 22 U 12 U Tributylphosphate_

^{*=} Outside of EPA CLP QC limits.

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Lionville Labs, Inc. Contract: 1343-06-01

Case No.: TNUHANFORD B01-059 H1393 RFW Lot No.: 0106L113-001

MATRIX Spike - Sample No.: B126D6

Level:(low/med) <u>LOW</u>

| COMPOUND | SPIKE ADDED UG/L | SAMPLE CONCENTRATION UG/L | MS CONCENTRATION UG/L | MS % REC # | QC LIMITS REC |
|----------------------------|---------------------------|------------------------------------|--------------------------------|------------------|---------------------|
| Phenol | 166 | 0.643 | 107 | 64 | 12 -110 |
| 2-Chlorophenol | 166 | 0 | 101 | 60 | 27 -123 |
| 1,4-Dichlorobenzene | 111 | j , o | 58.4 | 53 | 36 - 97 |
| N-Nitroso-Di-n-propylamine | 111 | 0 | 84.8 | 76 | 41 -116 |
| 1,2,4-Trichlorobenzene | 111 | 0 | 58.8 | 53 | 39 - 98 |
| 4-Chloro-3-methylphenol | 166 | 0 | 121 | 73 | 23 - 97 |
| Acenaphthene | 111 | 0 | 74.1 | 67 | 46 -118 |
| 4-Nitrophenol | 166 | 0 | 129 | 78 | 10 - 80 |
| 2,4-Dinitrotoluene | 111 | 0 | 86.7 | 78 | 24 - 96 |
| Pentachlorophenol | 166 | 0 | 81.3 | 49 | 9 -103 |
| Pyrene | _ 111 | 0 | 94.1 | 85 | 26 -127 |

| | SPIKE | MSD | MSD | 8 | 00.7 | TMTMC |
|----------------------------|-------|---------------|-------|----------|------|---------|
| | ADDED | CONCENTRATION | 8 | | - | LIMITS |
| COMPOUND | UG/L | UG/L | REC # | RPD # | RPD | REC |
| Phenol | 166 | 94.8 | 57 | 11 | 42 | 12 -110 |
| 2-Chlorophenol | 166 | 88.8 | 53 | 12 | 40 | 27 -123 |
| 1,4-Dichlorobenzene | 111 | 49.6 | 45 | 16 | 28 | 36 - 97 |
| N-Nitroso-Di-n-propylamine | 111 | 74.7 | 67 | 12 | 38 | 41 -116 |
| 1,2,4-Trichlorobenzene | 111 | 51.9 | 47 | 12 | 28 | 39 - 98 |
| 4-Chloro-3-methylphenol | 166 | 107 | 64 | 13 | 42 | 23 - 97 |
| Acenaphthene | 111 | 63.5 | 57 | 16 | 31 | 46 -118 |
| 4-Nitrophenol | 166 | 109 | 65 | 18 | 50 | 10 - 80 |
| 2,4-Dinitrotoluene | 111 | 76.7 | 69 | 12 | 38 | 24 - 96 |
| Pentachlorophenol | 166 | 64.8 | 39 | 22 | 50 | 9 -103 |
| Pyrene | 111 | 83.9 | 76 | 11 | 31 | 26 -127 |

[#] Column to be used to flag recovery and RPD values with an asterisk

RPD: 0 out of 11 outside limits

Spike Recovery: 0 out of 22 outside limits

COMMENTS:

FORM III SV-1

and the second s

5/88 Rev.

^{*} Values outside of QC limits

3C WATER SEMIVOLATILE BLANK SPIKE RECOVERY

Lab Name: Lionville Labs, Inc. Contract: 1343-06-01

Case No.: TNUHANFORD B01-059 H1393 RFW Lot No.: 0106L113

BLANK Spike - Sample No.: SBLKAOLE0737-MB1 Level: (low/med) LOW

| COMPOUND | SPIKE ADDED UG/L | SAMPLE CONCENTRATION UG/L | BS CONCENTRATION UG/L | BS % REC # | QC LIMITS REC |
|----------------------------|---|------------------------------------|--------------------------------|------------------|---------------------|
| | ======================================= | | | | |
| Phenol | 75.0 | 0 | 36.2 | 48 | 12 -110 |
| 2-Chlorophenol | 75.0 | 0 | 33.3 | 44 | 27 -123 |
| 1,4-Dichlorobenzene | 50.0 | 0 | 11.8 | 24 * | 36 - 97 |
| N-Nitroso-Di-n-propylamine | 50.0 | 0 | 27.0 | 54 | 41 -116 |
| 1,2,4-Trichlorobenzene | | 0 | 12.9 | 26 * | 39 - 98 |
| 4-Chloro-3-methylphenol | i 75.0 | j o | 37.0 | 49 | 23 - 97 |
| Acenaphthene | | j o | 21.1 | 42 * | 46 -118 |
| 4-Nitrophenol | | 0 | 33.5 | 45 | 10 - 80 |
| 2,4-Dinitrotoluene | 50.0 | į o | 23.9 | 48 | 24 - 96 |
| Pentachlorophenol | 75.0 | 0 | 16.7 | 22 | 9 -103 |
| Pyrene | i 50.0 | j o | 28.0 | 56 | 26 -127 |
| | i | İ | | | |

[#] Column to be used to flag recovery value with an asterisk

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The state of the s

Spike Recovery: 3 out of 11 outside limits

COMMENTS:

5/88 Rev.

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^{*} Values outside of QC limits

| Lionville Labo | ratory | Use | Only |
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Custody Transfer Record/Lab Work Request Page 1 of /

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

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| Project Conta | | and the second of the second of the second | | | | | Volume | | Liquid | 40 | 11 | | | | | | ro | 500 | 十一 | 500 | 4 | | |
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| Date Rec'd | ص_ | 10-05 | Date Due | 1-20-0 | <u> </u> | | | - · | | <u>></u> | 8 | 4.5 | Ť | | | | | | <u> </u> | نبــا | | | |
| MATRIX | | | | | Mat | | | | | | | 1 | + | | Lionvi | - 1 | | y Use On | T T | (4) | | | |
| CODES: | Lab | Cite | ent ID/Description | | Cho: | sen | Matrix | Date Collected | Time Collected | SCORT H | SOP SA | | | | |] ' | 9 | | 1025 | 5.5 | 5 | | |
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| DS - Drum Solids | | | | | | | | | | | | | | | | - | _ | _ | 1 | <u> </u> | | | |
| Di Drum Liquids | | | <u> </u> | | | | | | | | ` | | <u></u> | | | | | | 1 | | | | - |
| L EP/TCLP | | | | | | | | | | | | | | | | | | | | | | | |
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| X - Other F - Fish | | | | | | | | | | | | - | | | <u> </u> | | | | 1 | | | | |
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| | L | | · | <u> </u> | <u> </u> | DATE | EVISION | | | <u> </u> | | | | | i | LL | | Lion | rille Lab | oratory | Use O | nly | |
| Special Instruct | ions: | Saf Bo | 51-059 | | (| net(| <u>~</u> | ۱.Cd,C | c.Cu. | لبنت | <u>, , of</u> | <u>d4</u> | | | | | Sam | ples were: | | Tar | nper Res | stan <u>t</u> Se | |
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| İ | 44. | | | | | | | | | 3) R | eceived in | Good | ٥, | , 1000 | (A) or | N | | | | | | | |
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| 1 3y x | _+ | 1/2/10 | (halo) 093 | 뒴ㅡ | | | † | <u> </u> | | | | | | Recor | d? Y | | | fina Times | or N | Co | oler mp | 60 | °C |
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| Bechtel Ha | anford Inc. | С | HAIN OF CUST | ODY/S | AMPLI | E ANAL' | YSIS | RE | EQUEST | <u>.</u>] | В | 1-059-1 | Page 1 | of 1 |
|---|--|---|--|--|--|----------------------------------|------------------------------|--|-------------------|--|--|-------------------------|-----------|--|
| Collectur Thomas, G/Watson, D. | | Telephone No. Project Coordinator (509)372-9631 Price Project Coordinator TRENT, SJ | | | | | | rice Code | 7N | Data Turr | around | | | |
| Project Designation 200-TW-1 & 2 - QC Sa | ampling | | Sampling Location SAF No. T-26/200 W B01-059 | | | | | | | ir Quality | 45 I | ays | | |
| Ice Chest No. ERC | 1960651 | | Field Logbook No. EL-1518 COA B20TW1A44C Method of Shipment Fed Ex | | | | | | | nent | | | n 6/1 | |
| Shipped To TMARECRA | , | Offsit | e Property No. | 0 الا | 434 | , | | Bill | of Lading/A | A Bill No | 956 | / S | 300 | PHAIR |
| Sa ra | HAZARDS/REMARKS amples did not originate in adiological controlled area. No tal activity associated with | | Preservation | HNO3 to pH | Cool 4C | H2SO4 to pH <2 Cool 4C | HCl or H | | Cool 4C | HNO3 to pl | | | | 10/140 |
| | ample/samples. | A01 | Type of Container | P | P | P | aGs | 5.0 | #G | G | | <u> </u> | | · · |
| Special Handing | in or brorage | | No. of Container(s) | l | ì | 1 | 3 | | 2 | 2 | / | 1 | | |
| | | | Volume | 500mL | 500mL | 500mL | . 40m | nL | 1000mL | 1000mL | | | | |
| | SAMPLE ANAI | | See item (i) is Special Instructions | Special | 350.3; | VOA - E | | Semi-VOA 8270A (Add- On) (Tributyl phosphate) | Gross and | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | | |
| B126D6 | WATER | 06-18-01 | 1305 | X | <u> </u> | × | × | | \\ \tau^- | | | | | |
| | | <u> </u> | | | + | | | _ | | | | | ┪┈── | |
| | | <u> </u> | | | 1 | | 1 | | | | | | | |
| | | | | | | | | | | / | | | | |
| CHAIN OF POS | | | int Names tored in 3726 | ate/Time | | ECIAL INST | | | | | | | | Matrix * |
| Relinquished By/Removed I | FUTTL OGISION 18 | 30 REF. 2 | C 96/18 | 3/01 12 | (A | ICP Metals - 60 id-on) {Lead} | | | | | | | s - 6010A | SE-Soliment SC-Golid |
| Retinguished By/Removed | From 3778 Date/Time 09 | | (שוסעו ווי | Date/Time D | | IC Anions - 30 | 0.0 (Chlo | oride, F | Fluoride, Nitrate | , Nitrite, Ph | osphate, Sullate | ;} | | SI=Sluigs W = Water O=Oil |
| Raynached By/Removed | From Date/Time QQ | Received By/S | tored in | ate/Time | | | | - 4 | - 4/ |] | 1540 | | | A=Air DB=Drum Solids DL=Drum Liquids |
| Relinquished By Removed | Date/Time | 32 | Sampl Shipp | les stor ing Fac | red 12 cility | n Ref.# | P/DI | | | | T=Timme Wi=Wipe L=Liquid | | | |
| Relinquished By/Removed i | tored in | by 090 Date/Time | 22 | Collec | for no | t sve | ilable to re }{ for shipn | linauish . | | | | V=Vegetation X=Other | | |
| Relinquished By/Removed | | Date/Time | | | | | | | 69 | 01 | | | | |
| | eceived By | l | | | Fitle | | | | | | | | Date/Time | L |
| SECTION | | · . | | , | | Di- | posed By | | | | | | Date/Time | |
| FINAL SAMPLE DISPOSITION | Disposal Method | _ | | | | r)isi | ровой Бу | | | | | | | |

Lionville Laboratory, Inc. VOA ANALYTICAL DATA PACKAGE FOR TNUHANFORD B01-059 H1393

RFW LOT # :0106L113

| CLIENT ID | RFW | # | MTX | PREP # | COLLECTN | DATE REC | EXT/PREP | ANALYSIS |
|------------------|------------|-----|-----|----------------------|------------|----------------------|------------|----------------------|
| B126D6 B126D6 | 001 | MG | w | | | 06/20/01 06/20/01 | | 06/29/01 |
| B126D6 | | MSD | W | | | 06/20/01 | | 06/29/01 06/29/01 |
| LAB QC: | | | | | | | | |
| VBLKFX VBLKFX | MB1 MB1 | BS | W | 01LVX189 01LVX189 | n/a n/a | n/A n/A | N/A N/A | 06/29/01 06/29/01 |





Client: TNU-HANFORD B01-059

RFW #: 0106L113

SDG/SAF #: H1393/B01-059

W.O. #: 11343-606-001-9999-00

Date Received: 06-20-2001

GC/MS VOLATILE

One (1) water sample was collected on 06-18-2001.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 06-29-2001.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

- 1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
- 2. The sample was analyzed within required holding time.
- 3. Non-target compounds were not detected in the sample.
- 4. All surrogate recoveries were within EPA QC limits.
- 5. All matrix spike recoveries were within EPA QC limits.
- 6. All blank spike recoveries were within EPA QC limits.
- 7. The method blank contained the common laboratory contaminants Methylene Chloride and Acetone at levels less than 2x the CRQL.
- 8. Internal standard area and retention time criteria were met.
- 9. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

. Michael Taylor

President

Lionville Laboratory Incorporated

som\group\data\voa\tnu-hanford\0106-113.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

GLOSSARY OF VOA DATA

DATA QUALIFIERS

- U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D = Identifies all compounds identified in an analysis at a secondary dilution factor.
- 1 = Interference.
- NO = Result qualitatively confirmed but not able to quantify.
- Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y = Additional qualifiers used as required are explained in the case narrative.



7

GLOSSARY OF VOA DATA

ABBREVIATIONS

| BS | ** | Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported. |
|-------|----|--|
| BSD | * | Indicates blank spike duplicate. |
| MS | • | Indicates matrix spike. |
| MSD | - | Indicates matrix spike duplicate. |
| DL | • | Suffix added to sample number to indicate that results are from a diluted analysis. |
| NA | - | Not Applicable. |
| DF | - | Dilution Factor. |
| NR | - | Not Required. |
| SP, Z | - | Indicates Spiked Compound. |



TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

- MP Missed Peak: manually added peak not found by automatic quantitation program.
- PA Peak Assignment: quantitation report was changed to reflect correct peak assignment.
- RI Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.
- SP Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
- CB Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.
- PI Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.



L-WI-035/a-mi-10/00

Report Date: 07/18/01 15:12

Lionville Laboratory, Inc.

Volatiles by GC/MS, HSL List

RFW Batch Number: 0106L113 Client: TNUHANFORD B01-059 H1393 Work Order: 11343606001 Page: la

| Cust ID: | B126D6 | 5 | B126D6 | 5 | B126D6 | 5 | VBLKFX | | VBLKFX BS | |
|----------------------------------|--------------|------|-----------------|-----|------------------|-----|---------------------|-----|---------------------|---|
| Sample RFW#: Information Matrix: | 001 WATER | | 001 MS WATER | | 001 MSD WATER | | 01LVX189-B WATER | | 01LVX189-M WATER | |
| D.F.: | 1.0 | | 1.0 | | 1.0 | | 1.0 | | 1.0 | |
| Units: | ug/I | | ug/I | 1 | ug/L | 1 | ug/I | | ug/L | • |
| Toluene-d8 | 101 | 8 | 97 | 8 | 98 | ક | 101 | * | 101 | * |
| Surrogate Bromofluorobenzene | 103 | 8 | 100 | 옿 | 100 | * | 103 | * | 105 | * |
| Recovery 1,2-Dichloroethane-d4 | 89 | * | 87 | ક્ષ | 86 | * | 94 | ક્ષ | 95 | 8 |
| | ======= | =f1= | | | ======== | =f1 | | =f1 | | |
| Chloromethane | 10 | U | | Ū | 10 | U | 10 | U | | U |
| Bromomethane | 10 | U | 10 | U | 10 | Ü | 10 | U | 10 | Ŭ |
| Vinyl Chloride | 10 | U | 10 | _ | 10 | U | 10 | U | 10 | = |
| Chloroethane | 10 | Ū | _ | U | _ - | IJ | 10 | U | 10 | U |
| Methylene Chloride | 6 | В | 2 | JB | 7 | В | 10 | | 7 | В |
| Acetone | 10 | U | 10 | U | 10 | U | 6 | J | 10 | Ŭ |
| Carbon Disulfide | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| 1,1-Dichloroethene | 5 | U | 107 | * | 115 | ક્ર | 5 | U | 107 | * |
| 1,1-Dichloroethane | 5 | U | 5 | Ũ | 5 | U | 5 | U | 5 | Ū |
| 1,2-Dichloroethene (total) | 5 | U | 5 | U | 5 | U | 5 | U | 5 | Ŭ |
| Chloroform | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| 1,2-Dichloroethane | 5 | U | 5 | Ū | 5 | U | 5 | U | 5 | Ŭ |
| 2-Butanone | 10 | U | 10 | U | 10 | Ü | 10 | U | 10 | U |
| 1,1,1-Trichloroethane | 5 | U | 5 | Ü | 5 | υ | 5 | U | 5 | U |
| Carbon Tetrachloride | 5 | U | 5 | Ū | 5 | U | 5 | U | 5 | U |
| Bromodichloromethane | 5 | U | 5 | Ū | 5 | U | 5 | Ū | 5 | U |
| 1,2-Dichloropropane | 5 | Ü | 5 | U | 5 | U | 5 | U | 5 | Ŭ |
| cis-1,3-Dichloropropene | 5 | U | 5 | U | 5 | U | 5 | U | 5 | ŭ |
| Trichloroethene | 5 | U | 102 | 왕 | 100 | ક | 5 | U | 104 | * |
| Dibromochloromethane | 5 | U | 5 | U | 5 | U | 5 | U | 5 | Ŭ |
| 1,1,2-Trichloroethane | 5 | U | 5 | U | 5 | U | 5 | U | 5 | Ū |
| Benzene | 5 | U | 106 | 8 | 105 | ક | 5 | U | 114 | 8 |
| Trans-1,3-Dichloropropene | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| Bromoform | 5 | U | 5 | Ü | 5 | U | 5 | U | 5 | U |
| 4-Methyl-2-pentanone | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 2-Hexanone | 10 | U | 10 | U | 10 | Ü | 10 | U | 10 | U |
| Tetrachloroethene | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| 1,1,2,2-Tetrachloroethane | | U | 5 | U | 5 | U | 5 | U | 5 | U |
| Toluene | 5 | U | 102 | 왐 | 102 | 왐 | 5 | U | 103 | ४ |

^{*=} Outside of EPA CLP QC limits.

| RFW Batch Number: 0106L1 | l13 Clie | ent: TNUH | ANFO | RD B01-059 | н139 | 3 Work C | orde | r: 11343606 | 001 | Page: 1 | 5 |
|--|----------|-----------|------|------------|------|----------|------|-------------|-----|------------|-------------|
| | Cust ID: | B126D6 | • | B126D6 | | B126D6 | 5 | VBLKFX | • | VBLKFX BS | _ |
| | RFW#: | 001 | | 001 MS | | 001 MSI |) | 01LVX189-M | в1 | 01LVX189-1 | Œ1 |
| Chlorobenzene | | 5 | U | 100 | * | 96 | | 5 | U | 102 | |
| Ethylbenzene | | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| Styrene | | 5 | Ų | 5 | U | 5 | Ü | 5 | U | 5 | U |
| <pre>Xylene (total) *= Outside of EPA CLP QC</pre> | limits. | 5 | U | 5 | U | 5 | Ū | 5 | ប | 5 | U |

| Lionville | Laboratory | Use | Only |
|-----------|------------|-----|------|
| 010 | XOLII | 3 | |

Custody Transfer Record/Lab Work Request Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

| | | | | | | | | | | | 88 6 | 30° | | | | | | F | | G- | 4 | _ \- | - | 1808470 | ATTINC. |
|------------------------------|----------|----------------|--|---------------|-------------|---------------|----------------------|----------|----------------|-----------------|------------------|---------------------|--------------|------|--------|---------------------|--|--------|--------------------|--------------------|--|---------------------------|--------------------|----------------|-------------|
| Client | TIDE | 1-Hanfo | occh (| BO1# (| 159 | | | Refrige | rator# | • | ١ | 4 | | | | | | 4 | | 4 - | H | W - | | | |
| Est. Final Pro | j. Sam | pling Date | | | ** | | نب | #/Type | Container | Liquid | 3v | 294 | | | | | | A | - | JAG | 1 | 3 | 1 | | |
| Project # | 1347 | 3-60Xp-C | 201-9 | 999 C | 0 (| | | | | Solid | | | | | | | | | ļ <u> </u> | <u> </u> | | | | | |
| Project Conta | ct/Pho | ne # | | | | | | Volume | | Liquid | 40 | 11_ | | | | | | 2003 | | 500 | 1 | - | <u> </u> | | |
| Lionville Lab | oratory | Project Manage | * 07 | | | | | | | Solid | | | | | | | <u>. </u> | | | <u> </u> | <u> </u> | | | | |
| oc Sprc | | Doi Sta | TAT | <u>30 (</u> | <u>109</u> | | | Presen | vatives | <u> </u> | ₹5α ₁ | | ANIC | | | | | Hnoz | , | <u> ~ -</u> | <u>†</u> | usea1 | <u> </u> | | <u> </u> |
| , | | | | | • | | | ANALY | | _ | ┥ | 1 | _ | φ | • | | | | DRG | 1 | | | | ļ | |
| Date Rec'd | (0 | 50-07 | Date Due | | <u>0.0£</u> | }_ | | REQUE | STED | | δ V | BN AN | Pest/ | Herb | | | | Meta | S | | | | | | |
| MATRIX | | | | | | trix | | | | | | , | ţ | | Lionvi | ile Lai | porat | ory Us | e Onl | ý | 1 | | | | |
| CODES: | Lab | Cité | ent (D/Desci | rintion | | Che |)C osen | Matrix | Date | Time | ェ | % | | | ļ | | | 0 | ł | . | OTI | اح | <u> </u> | | |
| 8 - Soil SE - Sediment | ID | , , | | ; ; | | (| ~) | MEGIA | Collected | Collected | H MOON | (2) Sal | | | ĺ | | ĺ | ¥ | | 1758 | 883 | E 5 | 25. | | |
| SO - Solid SL - Sludge | | | | | | MS | MSD | | | | 8 | 8 | | | | | | Ĕ | ļ | 444 | HHH | मिम | Й | | |
| W - Water O - Oil | ∞ | B1300 | <u> </u> | | | | 1 | w. | 1080 | 1305 | ~ | | | | | | | _ | | _ | _ | _ | _ | | |
| A - Air DS - Drum | | | | | | | | | | | | <u> </u> | | | | | | | | <u> </u> | | <u> </u> | | | |
| Solids OL - Orumi | | | | | | | | | | | | | | | | | | | | | $oldsymbol{ol}}}}}}}}}}}}}}}}}}$ | | | | L^{-} |
| L- EP/TCLP Leachais Wi- Wipe | | | <u> </u> | | | | | | | | | | | | | [· .] | | | | | <u> </u> | | | | |
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| X - Other | | | | ii. | 1.5 | | | | | - | | | | | | | | | | | | | | | |
| F - Fish | | | | | | | | | | | | | | | | | | | | | | | | | Γ |
| | | | | | | | | | | ļ <u> </u> | | | | | | | | | | | | | | | |
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| Special Instruct | lions: | Saf Bo | :\-\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 9 | | <u> </u> | | REVISIO | | | | | | | | | | abla | | Lionvi | lle Labo | prstory | Use O | nly | |
| opoolui ilionaasi | | W1 00 |), 00 | • | | ١ | $\mathbb{D}^{c_{7}}$ | ·(V) | 1.Cd,C | ᠵᠺ᠘᠘ | لبنك | J &'', | 5P | | | | | | | were: | | | nper Res | | |
| ٠ | | | | | | | | | 2 | | | <u> </u> | | | | | | | | id —— livered . | | 1) Pa | Presen ckage | Kouy On | iter N |
| | | | | | | | | | 3 | | | | | | | | | إر | rbill # | 1 | 1- | 2) | Unbrok | ee.on (| Outer |
| | | | | | | | | | A | | | | | | | | | | | nt or C | | | ckage (Present | | |
| | | | | | | | | | | | | | • | | | | | 3) | Receiv | ed in G | bood | ٠, ١ | | or Or | |
| | | | ^ | | | | | | 5 | | | · · · · | | | | | | | ondition Sample | <i>V</i>) or | , N | | Unbrok | | NI . |
| | | - | | _ | | | | | 6 | | | | _ | | | | | | | Preserv | | | mple 💋 XC Reco | | |
| Relinquished | 1 | Received by | Date | Time | Re | linqui: by | sned | | Received by | D | ate | Tim | 10 | | | es Betw bels and | | E) | Qasak- | lo∜) tilW ber | | Upon Sample Rec't or N | | | |
| L. Q.E. | 2/1/ | 11/19 | 6/20/01 | 0935 | | | | <u> </u> | | 0010 | | | | COC | Recon | d?Y o | r (N) | He | ndina T | imes | | | oler | 10 | 14 |
| 1 m of | - 0 | 1 ins | 1×1×1 | -/ | -ee | MP | OSIT | E | | OR G | NAL | | -11 | 40 | 235 | 799 | 54. | 529 | 48 | (Y) 04 | r N | Ter | mp | <u>(0</u> | . °C |

| 9 | |
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| \checkmark | |

| Bechtel Hanford Inc. | IN OF CUST | CUSTODY/SAMPLE ANALYSIS REQUEST B01-059-1 Page 1 Telephone No. Project Coordinator | | | | | | | | | of 1 | |
|---|----------------------------------|--|---|---|--------------------|--------------------|---------------------------------------|------------------------------|----------------|-----------------|--------------|---|
| Collector Thomas, G/Watson, D. | Company C Todd, M. | | | ie No. 172-9631 | | | Project Coordii TRENT, SJ | ator P | rice Code | 7N | Data Tur | naround |
| Project Designation 200-TW-1 & 2 - QC Sampling | Sampling L T-26/200 | | | • | | | SAF No. B01-059 | A | ir Quality | , _□ | 45] | Days |
| Ice Chest No. FRC 96-065 (10fz) | Field Logbo EL-1518 | | | COA B20TW1 | IA44C | | Method of Ship Fed Ex | ment | | | - 41 | |
| Shipped To- TMARECRA | Offsite Proj | perty No. A | 010 | 434 | (| | Bill of Lading | A Silvery | 956 | 1.3 | 200 | PINIO |
| POSSIBLE SAMPLE HAZARDS/REMARKS Samples did not originate in radiological controlled area. No | | Preservation | HNO3 to pH ⊲2 | Cool 4C | H2SO4 to pH | HClorH2 topH <2 | | HNO3 to pH | | | | 37140 |
| total activity associated with sample/samples. Special Handling and/or Storage | T | ype of Container | P | P | P | aGs* | | ₽G PG | | | | |
| Special Handing and/or Storage | No | o. of Container(s) | . 1 | ı | 1 | 3 | 2 | 2 | / | | | |
| | | Volume _, | 500mL | 500mL | 500mL | , 40ml | L 1000mL | 1000mL | | | | |
| Sample analysis | | | See item (1) in Special Instructions. | See item (2) Special Instructions | 350.3; | VOA - 82 (TCL | | Gross Alpha Gross Ing | | | | |
| Sample No. Matrix * Sam | ole Date | Sample Time | | | | | | | | | | |
| B126D6 WATER 06-18 | -01 | 1305 | ·X | × | X | × | Y | | | | | |
| | | 1 | | - | | <u> </u> | | | | | | |
| | | | | | | | | - | | + | - | |
| | | | | | | | | / | | | | |
| Relinquished By/Removed From Date/Time Receiv | ign/Print Nat ed By/Stored In | 3728 D | ate/Time | | ECIAL INSTR | |) NS .) {Cadmium, Chro | niama Conne | r Nickel Sibae | rl- ICD lateria | 60104 | Matrix * |
| RETINGUISHED BY/REMOVED From 3728 Date/Time OGO Received | | HThoren ^a | ate/Time 04 | (A) | dd-on) (Lead) | • | ide, Fluoride, Nitrate | • •• | | • | - 0010A | SB=Sediment SC=Selid SI=Skedge |
| Kee 20 G. Fr.O. P | ed By/Stored In | | <u>-14.C</u> ate/Time |)) | | | | | | | | W=Weler O=Gii A=Air |
| 1 - Gia 7 | $=$ ϵ \cup | (QX) | ste/Time | | Sample | es store | d in Ref.# | _at the 3 | 728 | | | DS-Drum Solids DL-Drum Liquids T-Tienes |
| FUE 6 60/01 0935 Will Ausunt 6/2 | | | | 35 | Shippii Collect | ng Faci for not | ility on <u>//</u> available to re | <i>€/_</i> Q(. linguish s | amples | | | Wi-Wipe L-Liquid V=Vegatation |
| Relinquished By/Removed From Date/Time Receive | ed By/Stored In | | ate/Time | | 00_6 | 191 | OL for ships | ient | ZT | | | X=Other |
| Relinquished By/Removed From Date/Time Receiv | ed By/Stored In | D: | ate/Time | | | | | | 644 | 91 | • | |
| LABORATORY Received By SECTION | | | Т | itle | | | | • | | | Date/Time | |
| FINAL SAMPLE Disposal Method DISPOSITION | | <u>-</u> . | | | Dispo | osed By | _ | | <u>.</u> | | Date/Time | |

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1393 was composed of one water sample designated under SAF No. B01-059 with a Project Designation of: 200-TW-1 & 2 – QC Sampling.

The sample was received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Molissa C. Mannion

Program Manager

8/3/0

Date



SAMPLE DELIVERY GROUP H1393

SDG 7018 Contact Melissa C. Mannion

SAMPLE SUMMARY

| Client | Hanford |
|----------|-----------|
| Contract | No. 630 |
| Case no | SDG_H1393 |

| CLIENT SAMPLE ID | LOCATION | MATRIX LEVEL | LAB SAMPLE ID | SAF NO | CHAIN OF CUSTODY | COLLECTED |
|------------------------|------------|--------------|------------------|---------|---------------------|----------------|
| B126D6 | T-26/200 W | WATER | R106111-01 | B01-059 | B01-059-01 | 06/18/01 13:05 |
| Method Blank | | WATER | R106111-03 | B01-059 | | |
| Lab Control Sample | | WATER | R106111-02 | B01-059 | | |
| Duplicate (R106111-01) | T-26/200 W | WATER | R106111-04 | B01-059 | | 06/18/01 13:05 |

SAMPLE SUMMARY Page 1 SUMMARY DATA SECTION Page 3

Lab id TMANC Protocol <u>Hanford</u> Version Ver 1.0 Form DVD-CS Version 3.06 Report date <u>08/03/01</u>

SAMPLE DELIVERY GROUP H1393

SDG 7018
Contact Melissa C, Mannion

QC SUMMARY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Case no <u>SDG_H1393</u>

| QC BATCH | CHAIN OF CUSTODY | CLIENT SAMPLE ID | MATRIX | % SOLIDS | SAMPLE AMOUNT | BASIS AMOUNT | DAYS S | | LAB SAMPLE ID | DEPARTMENT SAMPLE ID |
|----------|---------------------|------------------------|--------|-------------|------------------|-----------------|----------|---|------------------|-------------------------|
| 7018 | B01-059-01 | B126D6 | WATER | | 2.0 L | | 06/20/01 | 2 | R106111-01 | 7018-001 |
| | | Method Blank | WATER | | | | | | R106111-03 | 7018-003 |
| | | Lab Control Sample | WATER | | | | | | R106111-02 | 7018-002 |
| | | Duplicate (R106111-01) | WATER | | 2.0 L | | 06/20/01 | 2 | R106111-04 | 7018-004 |

QC SUMMARY
Page 1
SUMMARY DATA SECTION
Page 4

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-9S
Version 3.06
Report date 08/03/01

SAMPLE DELIVERY GROUP H1393

| SDG | 7018 | |
|---------|-------------------|---------|
| Contact | <u>Melissa C.</u> | Mannion |

PREP BATCH SUMMARY

| Client | Hanford |
|----------|-----------|
| Contract | No. 630 |
| Case no | SDG H1393 |

| | | | PREPARATION ERROR | | | PLANCHETS ANALYZED | | | | | |
|-----------|---------------------|-------------------------------------|-------------------|------|--------|--------------------|----|-------|-----|------------------|-------|
| TEST | MATRIX | METHOD | BATCH | 2σ % | CLIENT | MORE | RE | BLANK | LCS | DUP/ORIG MS/ORIG | FIERS |
| Gas | Proportion WATER | al Counting Gross Alpha in Water | 6994-043 | 20.0 | 1 | | | 1 | 1 | 1/1 | _ |
| —— 93в | WATER | Gross Beta in Water | 6994-043 | 15.0 | 1 | | | 1 | 1 | 1/1 | · |

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.

Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

PREP BATCH SUMMARY
Page 1
SUMMARY DATA SECTION
Page 5

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-PBS</u>
Version <u>3.06</u>
Report date <u>08/03/01</u>

EBERLINE SERVICES/RICHMOND SAMPLE DELIVERY GROUP H1393

| SDG | 7018 | | |
|---------|---------|----|---------|
| Contact | Melissa | С. | Mannion |

WORK SUMMARY

| Client | Hanford |
|----------|-----------|
| Contract | No. 630 |
| Case no | SDG_H1393 |

| CLIENT SAMPLE | ID | MATRIX | LAB SAMPLE IC | • | | SUF- | | | | |
|--------------------------|----------|--------|----------------------|----------|--------|------|----------|----------|-----|----------------------|
| LOCATION CUSTODY | SAF No | MAIKIX | RECEIVED | PLANCHET | TEST | FIX | ANALYZED | REVIEWED | ВУ | METHOD |
| B126D6 | | | R106111-01 | 7018-001 | 93A/93 | | 07/27/01 | 08/03/01 | мсм | Gross Alpha in Water |
| T-26/200 W B01-059-01 | B01-059 | WATER | 06/18/01 06/20/01 | 7018-001 | 938/93 | | 07/27/01 | 08/03/01 | MCM | Gross Beta in Water |
| Method Blank | | | R106111-03 | 7018-003 | 93A/93 | | 07/27/01 | 08/03/01 | MCM | Gross Alpha in Water |
| | 801-059 | WATER | | 7018-003 | 938/93 | | 07/27/01 | 08/03/01 | MCM | Gross Beta in Water |
| Lab Control Sa | mple | | R106111-02 | 7018-002 | 93A/93 | | 07/27/01 | 08/03/01 | MCM | Gross Alpha in Water |
| | в01-059 | WATER | | 7018-002 | 938/93 | | 07/27/01 | 08/03/01 | MCM | Gross Beta in Water |
| Duplicate (R10 | 6111-01) | | R106111-04 | 7018-004 | 93A/93 | | 08/02/01 | 08/03/01 | MCM | Gross Alpha in Water |
| T-26/200 W | B01-059 | WATER | 06/18/01 06/20/01 | 7018-004 | 93B/93 | | 08/02/01 | 08/03/01 | MCM | Gross Beta in Water |

| TEST | SAF No | COUNTS | OF TESTS BY | SAMPLE TYPE CLIENT MORE | RE BLANK | LCS | DUP SPIKE | TOTAL |
|--------|---------|----------------------|------------------|-------------------------|----------|-----|-----------|-------|
| 93A/93 | B01-059 | Gross Alpha in Water | 900.0_ALPHABETA_ | GPC 1 | 1 | 1 | 1 | 4 |
| 93B/93 | 801-059 | Gross Beta in Water | 900.0_ALPHABETA_ | GPC 1 | 1 | 1 | 1 | 4 |
| TOTALS | | | | 2 | 2 | 2 | 2 | 8 |

WORK SUMMARY
Page 1
SUMMARY DATA SECTION
Page 6

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 08/03/01

EBERLINE SERVICES/RICHMOND SAMPLE DELIVERY GROUP H1393

R106111-03

METHOD BLANK

Method Blank

| | 7018 Melissa C. Mannion | Client/Case no Contract | SDG_H1393 |
|---------------------------------|----------------------------|---|---------------|
| Lab sample id Dept sample id | | Client sample id Material/Matrix SAF No | WATER |

| ANALYTE | CAS NO | RESULT pCi/L | 2σ ERR (COUNT) | MDA pCi/L | RDL pCi/L | QUALI- FIERS | TEST |
|-------------|------------|-----------------|-------------------|--------------|--------------|-----------------|------|
| Gross Alpha | 12587-46-1 | -0.365 | 0.45 | 1.1 | 3.0 | ŭ | 93A |
| Gross Beta | 12587-47-2 | 0.405 | 2.2 | 3.6 | 4.0 | U | 93B |

QC-BLANK #39080

METHOD BLANKS
Page 1
SUMMARY DATA SECTION
Page 7

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/03/01

SAMPLE DELIVERY GROUP H1393

R106111-02

LAB CONTROL SAMPLE

Lab Control Sample

| SDG <u>7018</u> Contact <u>Melissa C. Mannion</u> | Client/Case no <u>Hanford SDG H1393</u> Case no <u>No. 630</u> |
|--|---|
| Lab sample id <u>R106111-02</u> Dept sample id <u>7018-002</u> | Client sample id <u>Lab Control Sample</u> Material/Matrix <u>WATER</u> SAF No <u>B01-059</u> |

| ANALYTE | RESULT pci/L | 2σ ERR (COUNT) | MDA pCi/L | RDL pCi/L | QUALI- FIERS | TEST | ADDED pCi/L | 2σ ERR pCi/L | REC | 30 LMTS (TOTAL) | PROTOCOL LIMITS |
|---------------------------|-----------------|-------------------|--------------|--------------|-----------------|------------|----------------|-----------------|----------|--------------------|--------------------|
| Gross Alpha Gross Beta | 58.8 76.4 | 4.8 3.8 | 1.3 2.8 | 3.0 4.0 | | 93A 93B | 71.7 80.7 | 2.9 | 82 95 | | 70-130 70-130 |

LAB CONTROL SAMPLES
Page 1
SUMMARY DATA SECTION
Page 8

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 08/03/01

SAMPLE DELIVERY GROUP H1393

R106111-04

DUPLICATE

B126D6

| SDG 7018 | | Client/Case no <u>Hanford</u> <u>SDG H1393</u> |
|---------------------------------|---------------------------------|--|
| Contact Melissa C. Mannion | | Case no <u>No. 630</u> |
| DUPLICATE | ORIGINAL | |
| Lab sample id <u>R106111-04</u> | Lab sample id <u>R106111-01</u> | Client sample id <u>B126D6</u> |
| Dept sample id <u>7018-004</u> | Dept sample id <u>7018-001</u> | Location/Matrix <u>T-26/200 W WATER</u> |
| | Received <u>06/20/01</u> | Collected/Volume <u>06/18/01 13:05 </u> |
| | | Custody/SAF No <u>B01-059-01</u> <u>B01-059</u> |

| ANALYTE | DUPLICATE pCi/L | 2σ ERR (COUNT) | MDA pCi/L | RDL pCi/L | QUALI- FIERS | TEST | ORIGINAL pci/L | 2σ ERR (COUNT) | MDA pCi/L | QUALI- FIERS | RPD % | 3σ PROT TOT LIMIT |
|-------------|--------------------|-------------------|--------------|--------------|-----------------|------|-------------------|-------------------|--------------|-----------------|----------|----------------------|
| Gross Alpha | 0.055 | 0.41 | 0,72 | 3.0 | U | 93A | -0.018 | 0.47 | 0.87 | U | | |
| Gross Beta | 3.50 | 1.3 | 1.9 | 4.0 | J | 93B | 3.58 | 1.3 | 1.9 | J | 2 | 84 |

DUPLICATES
Page 1
SUMMARY DATA SECTION
Page 9

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-DUP

Version 3.06

Report date 08/03/01

EBERLINE SERVICES/RICHMOND SAMPLE DELIVERY GROUP H1393

R106111-01

DATA SHEET

B126D6

| | 7018 Melissa C. Mannion | Client/Case no Contract | | SDG_H1393 |
|---|----------------------------|---|------------------------------|---------------------|
| Lab sample id Dept sample id Received | | Client sample id Location/Matrix Collected/Volume Custody/SAF No | T-26/200 W 06/18/01 13:05 | WATER 2.0 L B01-059 |

| ANALYTE | CAS NO | RESULT pCi/L | 2σ ERR (COUNT) | MDA pCi/L | RDL pCi/L | QUALI- FIERS | TEST |
|-------------|------------|-----------------|-------------------|--------------|--------------|-----------------|------|
| Gross Alpha | 12587-46-1 | -0.018 | 0.47 | 0.87 | 3.0 | บ | 93A |
| Gross Beta | 12587-47-2 | 3.58 | 1.3 | 1.9 | 4.0 | J | 93B |

DATA SHEETS
Page 1
SUMMARY DATA SECTION
Page 10

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/03/01

SAMPLE DELIVERY GROUP H1393

Test <u>93A</u> Matrix <u>WATER</u>
SDG <u>7018</u>
Contact <u>Melissa C. Mannion</u>

METHOD SUMMARY GROSS ALPHA IN WATER GAS PROPORTIONAL COUNTING

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H1393</u>

RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | TEST FIX | | Gross A | llpha | | |
|-------------------------|------------------|----------|-------------|---------|-------|--|------|
| Preparation batch 6994- | 043 | | | | | | |
| B126D6 | R106111-01 | 93 | 7018-001 | υ | | | |
| BLK (QC ID=39080) | R106111-03 | 93 | 7018-003 | U | | | |
| LCS (QC ID=39079) | R106111-02 | 93 | 7018-002 | ok | | | |
| Duplicate (R106111-01) | R106111-04 | 93 | 7018-004 | - | U | | |
| Nominal values and limi | ts from metho | od R | DLs (pCî/L) | 3.0 | | | |

METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF- MC FIX pCi/ | | | DILU- | RESID mg | EFF % | | DRIFT KeV | | PREPARED | ANAL- YZED | DETECTOR |
|---|-------------------|-------------|---------------------|-----------|-------|---------|-------------|----------|-----|--------------|-----|----------|---------------|----------|
| Preparation batch 6994- | 043 2 <i>σ</i> pr | ep er | or 20.0 % | Reference | e Lab | Noteboo | k 6994 | pg. | 043 | | | | | |
| B126D6 | R106111-01 | 93 | 0.8 | 7 0.300 | | | 1 | | 100 | | 39 | 07/25/01 | 07/27 | GRB-109 |
| BLK (QC ID=39080) | R106111-03 | 93 | 1.1 | 0.300 | | | 22 | | 100 | | | 07/25/01 | 07/27 | GRB-106 |
| LCS (QC ID=39079) | R106111-02 | 93 | 1.3 | 0.300 | | | 21 | | 100 | | | 07/25/01 | 07/27 | GRB-105 |
| Duplicate (R106111-01) (QC ID=39081) | R106111-04 | 93 | 0.7 | 2 0.300 | | | 1 | | 100 | | 45 | 07/25/01 | 08/02 | GRB-101 |
| Nominal values and limi | ts from metho | od . | 3.0 | 0.300 | | | 5-25 | 0 | 100 | | 180 | | | |

| PROCEDURES | REFERENCE | 900.0_ALPHABETA_GPC |
|------------|-----------|---|
| | CP-060 | Soil Preparation, rev 3 |
| | CP-070 | Soil Dissolution, < 1.0g Aliquot, rev 4 |
| | CP-170 | Soil Preparation for Direct Gross Alpha and Gross |
| | | Beta Counting, rev 3 |
| E . | | |

AVERAGES ± 2 SD MDA 1.0 ± 0.51 FOR 4 SAMPLES RESIDUE 11 ± 24

METHOD SUMMARIES
Page 1
SUMMARY DATA SECTION
Page 11

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/03/01

SAMPLE DELIVERY GROUP H1393

Test 93B Matrix WATER
SDG 7018
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS BETA IN WATER
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H1393

RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW S | | Gross E | a | |
|-------------------------|------------------|-------|----------|---------|---|--|
| Preparation batch 6994- | 043 | | | | | |
| B126D6 | R106111-01 | 93 | 7018-001 | 3.58 | | |
| BLK (QC ID=39080) | R106111-03 | 93 | 7018-003 | U | | |
| LCS (QC ID=39079) | R106111-02 | 93 | 7018-002 | ok | | |
| Duplicate (R106111-01) | R106111-04 | 93 | 7018-004 | ok | | |

METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW : | | | PREP FAC | DILU- | RESID mg | EFF % | | | | PREPARED | ANAL - YZED | DETECTOR |
|---|------------------|--------|-----------|-----------|-------------|----------|-------------|----------|-----|--|-----|----------|----------------|----------|
| Preparation batch 6994- | 043 2σ pr | ep err | or 15.0 % | Reference | Lab | Notebool | 6994 | pg. | 043 | | | | | |
| B126D6 | R106111-01 | 93 | 1.9 | 0.300 | | | 1 | | 100 | | 39 | 07/25/01 | 07/27 | GRB-109 |
| BLK (QC ID=39080) | R106111-03 | 93 | 3.6 | 0.300 | | | 22 | | 100 | | | 07/25/01 | 07/27 | GRB-106 |
| LCS (QC ID=39079) | R106111-02 | 93 | 2.8 | 0.300 | | | 21 | | 100 | | | 07/25/01 | 07/27 | GRB-105 |
| Duplicate (R106111-01) (QC ID=39081) | R106111-04 | 93 | 1.9 | 0.300 | | | 1 | | 100 | | 45 | 07/25/01 | 08/02 | GRB-101 |
| Mominal values and limit | ts from metho | xd | 4.0 | 0.300 | | , | 5-250 | 0 | 100 | | 180 | | | |

| PROCEDURES | REFERENCE | 900.0_ALPHABETA_GPC |
|------------|-----------|---|
| 1 | CP-060 | Soil Preparation, rev 3 |
| | CP-070 | Soil Dissolution, < 1.0g Aliquot, rev 4 |
| | CP-170 | Soil Preparation for Direct Gross Alpha and Gross |
| | | Beta Counting, rev 3 |

AVERAGES ± 2 SD MDA 2.6 ± 1.6

FOR 4 SAMPLES RESIDUE 11 ± 24

METHOD SUMMARIES
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SUMMARY DATA SECTION
Page 12

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/03/01

| Bechtel Hanford Inc. | CI | IAIN OF CUST | ODY/S | AMPLE | ANAL | YSIS | REQUEST | ר | В | 01-059-1 | Page 1 | of 1 |
|--|----------------|--------------------------|---|--|---|----------------------|---|------------------------|--------------------|---------------------------------------|-------------|--|
| Collector Thomas, G/Watson, D. | Compa | ny Contact L. M. | Telephor (509)3 | ne No. 172-9631 | | | Project Coordi TRENT, SJ | nator | Price Code | 7N | Data Tu | rnaround |
| Project Designation 200-TW-1 & 2 - QC Sampling | Sampli | | 1393 | (7018 | \mathcal{L} | | SAF No. B01-059 | | Air Qualit | y 🗆 | 45 | Days |
| Ice Chest No. SMI-137 Lzofz | Field I | ogbook No. 518 | | COA B20TW1A | 44C | | Method of Ship Fed Ex | ment | | | | |
| Shinned To EBEPINE | Offsite | Property No. | \$10L | 123 | | | Bill of Lading | 3 5 | 7454 | 1 6 | 7 23 | 37 |
| POSSTBLE SAMPLE HAZARDSREMARKS Samples did not originate in radiological controlled area. No | | Preservation | HNO3 to pH <2 | Cool 4C | H2SO4 to pH <2 Cool 4C | HCl or H to pH <2 | | HNO3 to ; | pH | | | |
| total activity associated with sample/samples. | | Type of Container | P | P | P | aGs* | | \$G | | | | |
| samplesamples. Special Handling and/or Storage 6-17-0 | | No. of Container(s) | 1 | 1 | 1 | 3 | 2 | $\binom{2}{2}$ | 力 | | | |
| , | | Volume | 500mL | 500mL | 500mL | 40ml | L 1000mL | 1000m | L | | | |
| SAMPLE ANALYSIS | | | See item (1) in Special Instructions. | See item (2) in Special Instructions | Americania - 350.3; NOZANO 1911-1009 | MA - 82 | | Gross Alpi Gross Be | | | | |
| Sample No. Matrix * Sa | ample Date | Sample Time | | | | | | | | | | |
| B126D6 (1+ WATER 6-1 | 18-01 | 1305/ | | <u> </u> | | | | X_{ℓ} | 4 | | | |
| | | | / | 1 | | | | | | | | |
| | | | / | | | | | | | | | |
| | | | | | | | | | | | | |
| CHAIN OF POSSESSION | Sign/Print | | | SPEC | IAL INSTR | UCTIO | NS | | | | | Matrix * |
| TOS WATSON - WILL OGISIO 1530 R RESponsished By/Removed From Date/Time 0900 - Res K. II. Z.C. 3728 (a. 9.0) K | cived By/Store | 3728 06/18/ 12 Morson | 7/Time 04 } (O) | | P. Metals 6011 a) (Ecol.) | | (Codeine, Cham le Ehroid, Nitote | Net i , Pl | a, Malest, Silvar) | · · · · · · · · · · · · · · · · · · · | Y | 8=Soil SB=Soliment SO=Solid SI=Sladge W = Water O=Oil |
| Continued By Removed From Toronto Time 0900 Res | | RICE FY | JE J | Ø | Sample | e stored | in Ref.# <u>Z</u> | ot the | 3778 | 6- | 19-01 | A=Air D8=Drum Solids DL=Drum Liquids |
| Relinquished By/Removed From Date/Time 10/10/Rec | erved By/Store | 1 th | e/Time / 20−61 | 10-0m | Shippin | g Facil | ity on <u>/ </u> | <u> </u> | , | | · | T=Tiene WI-Wipe L=Liquid |
| | eived By Starb | | e/Time | | on | or not a | vailable to reli | nquisn ent. | samples PT | _ | : | V=Vegetation X=Other |
| Relinquished By/Removed From Date/Time Rec | eived By/Store | i In Dat | o/Ti <u>pp</u> e | | | | | | 6-9.0 | 2/ | | |
| LABORATORY Received By SECTION | | * | Titl | e | | | | | | Da | te/Time | |
| FINAL SAMPLE Disposal Method DISPOSITION | | | | | Dispos | ed By | | - | | Da | nte/Time | |

SAMPLE RECEIPT CHECKLIST

| | SAMPLE RECEIP | Γ | | |
|----------|---|------------------|-------------------|-------------|
| Client: | BECHTEL HANFORD INC, | /Time received | 6-20-01 | 10.7 |
| CoC No | B01-059-1 | | | <u> </u> |
| | ner I.D. No. SML-137 Requested TAT (Day | (s) 20 P.O | Received Yes | [] No [-] |
| | INSPECTION | | | |
| 1. | Custody seals on shipping container intact? | Yes [/] | No [] | N/A [] |
| 2. | Custody seals on shipping container dated & signe | d? Yes [/] | No[] | N/A [] |
| з. | Custody seals on sample containers intact? | Yes [] | No [] | N/A [] |
| 4. | Custody seals on sample containers dated & signer | d? Yes [/] | No [] | [] A\N |
| 5. | Cooler Temperature: Pack | ing material is: | Wet [] | Dry [] |
| 6. | Number of samples in shipping container: | 8Amples | | |
| 7. | Number of containers per sample: 2 FActi | Or see Coc | | |
| 8. | Paperwork agrees with samples? | Yes [/] | No [] | |
| 9. | Samples have: Tape [] Hazard labels [] Rad! | abels [] Appro | opriate sample la | bels [∠] |
| 10. | Samples are: In good condition [/ Leaking [|] Broken Con | tainer [] Mis | sing [] |
| 11. | Describe any anomalies: THE ATRALL | L WONT | MATCH | |
| | WETH THE CA | HALNOF | ourropy, | |
| 13, | Was P.M. notified of any anomalies? Yes [] | No[] D | ete 6-20-0 | 1 2: 94 |
| 14. | | e: 6-20-0 | | 7pm |
| Custome | er Sample No. cpm U mr/hr | Customer Sar | nple No. Cpr | n mr/hr |
| | | • | | |
| | | | | |
| | | | | |
| | | | | |
| ion Chan | nber Ser. No Calibr | ation date | | |
| Survey N | Neter Ser No Calibr | ation date | | <u> </u> |